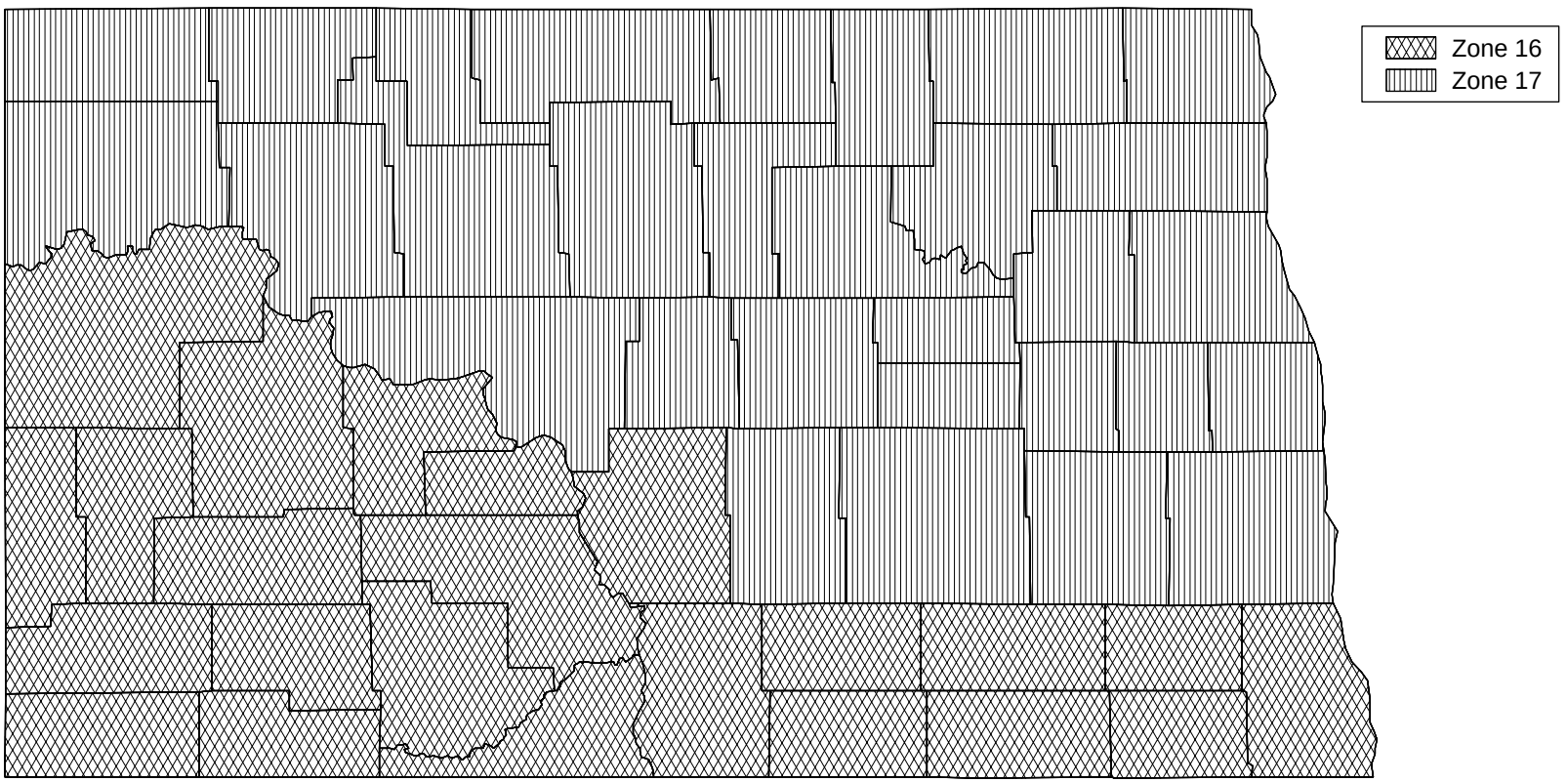
NORTH DAKOTA

Zone	County
16	Adams
17	Barnes
17	Benson
16	Billings
17	Bottineau
16	Bowman
17	Burke
16	Burleigh
17	Cass
17	Cavalier
16	Dickey
17	Divide
16	Dunn
17	Eddy
16	Emmons
17	Foster
16	Golden Valley
17	Grand Forks
16	Grant
17	Griggs
16	Hettinger
17	Kidder
16	La Moure
16	Logan
17	Mchenry
16	Mcintosh
16	Mckenzie
17	Mclean
16	Mercer
16	Morton
17	Mountrail
17	Nelson
16	Oliver
17	Pembina
17	Pierce
17	Ramsey
16	Ransom
17	Renville
16	Richland
17	Rolette
16	Sargent
17	Sheridan
16	Sioux
16	Slope
16	Stark
17	Steele
17	Stutsman
17	Towner
17	Traill
17	Walsh
17	Ward
17	Wells
17	Williams



Zone 16 Single-Family Prescriptive Packages - 1998/2000 IECC

Package	MAXIMUM		MINIMUM						Heating/Cooling Equipment Efficiency[9]
	Glazing Area %[1]	Glazing U-Factor[2]	Ceiling R-Value[3]	Wall R-Value[4]	Floor R-Value[5]	Basement Wall R-Value[6]	Slab Perimeter R-Value[7]	Crawl Space Wall R-Value[8]	
1	8%	0.42	R-38	R-16	R-19	R-16	R-8	R-16	Normal
2	12%	0.40	R-49	R-21	R-19	R-16	R-9	R-17	Normal
3	12%	0.40	R-49	R-19	R-21	R-18	R-12	R-20	Normal
4	12%	0.35	R-38	R-19	R-19	R-16	R-9	R-17	Normal
5	15%	0.35	R-49	R-21	R-21	R-18	R-14	R-20	Normal
6	18%	0.33	R-49	R-25	R-30	R-19	–	R-25	Normal
7	18%	0.30	R-49	R-21	R-21	R-19	R-14	R-22	Normal
8	20%	0.30	R-49	R-26	R-21	R-19	R-12	R-19	Normal
9	22%	0.30	R-49	R-22	R-30	R-28	--	--	Normal
10	25%	0.25	R-49	R-19	R-30	R-28	–	–	Normal
11	12%	0.60	R-49	R-19	R-13	R-11	R-2	R-11	High Heating
12	12%	0.50	R-38	R-13	R-19	R-15	R-3	R-18	High Heating
13	15%	0.60	R-49	R-19	R-21	R-19	R-7	R-28	High Heating
14	15%	0.45	R-49	R-13	R-19	R-16	R-4	R-20	High Heating
15	18%	0.50	R-49	R-18	R-21	R-19	R-6	R-28	High Heating
16	18%	0.40	R-49	R-13	R-21	R-18	R-5	R-24	High Heating
17	22%	0.40	R-49	R-17	R-19	R-17	R-5	R-22	High Heating
18	22%	0.35	R-49	R-19	R-13	R-11	R-2	R-11	High Heating

Zone 17 Single-Family Prescriptive Packages - 1998/2000 IECC

Package	MAXIMUM		MINIMUM						Heating/Cooling Equipment Efficiency[9]
	Glazing Area %[1]	Glazing U-Factor[2]	Ceiling R-Value[3]	Wall R-Value[4]	Floor R-Value[5]	Basement Wall R-Value[6]	Slab Perimeter R-Value[7]	Crawl Space Wall R-Value[8]	
1	8%	0.42	R-38	R-16	R-19	R-16	R-11	R-16	Normal
2	12%	0.40	R-49	R-21	R-19	R-16	R-11	R-17	Normal
3	12%	0.40	R-49	R-19	R-21	R-18	R-16	R-20	Normal
4	12%	0.35	R-38	R-19	R-19	R-16	R-11	R-17	Normal
5	15%	0.35	R-49	R-21	R-21	R-19	R-18	R-20	Normal
6	18%	0.33	R-49	R-25	R-30	R-19	–	R-25	Normal
7	18%	0.30	R-49	R-21	R-21	R-19	R-18	R-22	Normal
8	20%	0.30	R-49	R-26	R-21	R-19	R-16	R-19	Normal
9	22%	0.30	R-49	R-22	R-30	R-28	--	--	Normal
10	25%	0.25	R-49	R-19	R-30	R-28	–	–	Normal
11	12%	0.60	R-49	R-18	R-13	R-11	R-2	R-11	High Heating
12	12%	0.50	R-38	R-15	R-15	R-13	R-2	R-14	High Heating
13	15%	0.60	R-38	R-21	R-21	R-19	R-8	R-28	High Heating
14	15%	0.45	R-49	R-13	R-19	R-16	R-5	R-19	High Heating
15	18%	0.50	R-49	R-19	R-19	R-17	R-6	R-24	High Heating
16	18%	0.40	R-49	R-13	R-19	R-17	R-6	R-24	High Heating
17	22%	0.40	R-38	R-19	R-19	R-17	R-6	R-22	High Heating
18	22%	0.35	R-49	R-13	R-21	R-19	R-8	R-26	High Heating

Zone 16 Multifamily Prescriptive Packages - 1998/2000 IECC

Package	MAXIMUM		MINIMUM						Heating/Cooling Equipment Efficiency[9]
	Glazing Area %[1]	Glazing U-Factor[2]	Ceiling R-Value[3]	Wall R-Value[4]	Floor R-Value[5]	Basement Wall R-Value[6]	Slab Perimeter R-Value[7]	Crawl Space Wall R-Value[8]	
1	12%	0.55	R-49	R-19	R-15	R-12	R-3	R-11	Normal
2	12%	0.45	R-49	R-19	R-11	R-8	R-2	R-6	Normal
3	15%	0.50	R-49	R-19	R-19	R-17	R-10	R-18	Normal
4	15%	0.35	R-38	R-13	R-19	R-16	R-8	R-16	Normal
5	20%	0.40	R-49	R-19	R-21	R-19	R-16	R-22	Normal
6	25%	0.35	R-38	R-16	R-19	R-17	R-10	R-18	Normal
7	25%	0.35	R-49	R-24	R-21	R-20	R-19	R-24	Normal
8	30%	0.32	R-49	R-21	R-30	–	–	–	Normal
9	30%	0.30	R-49	R-25	R-21	R-20	R-18	R-24	Normal
10	12%	0.70	R-30	R-13	R-13	R-11	R-2	R-11	High Heating
11	12%	0.60	R-26	R-13	R-11	R-8	R-0	R-7	High Heating
12	15%	0.65	R-30	R-13	R-19	R-19	R-7	R-28	High Heating
13	15%	0.50	R-38	R-11	R-11	R-8	R-0	R-7	High Heating
14	20%	0.50	R-30	R-13	R-19	R-18	R-6	R-26	High Heating
15	20%	0.40	R-38	R-11	R-11	R-8	R-0	R-7	High Heating
16	25%	0.45	R-38	R-15	R-19	R-19	R-6	R-28	High Heating
17	25%	0.35	R-38	R-13	R-11	R-8	R-0	R-7	High Heating
18	30%	0.40	R-38	R-19	R-15	R-13	R-2	R-15	High Heating
19	30%	0.35	R-38	R-13	R-15	R-13	R-2	R-14	High Heating

Zone 17 Multifamily Prescriptive Packages - 1998/2000 IECC

Package	MAXIMUM		MINIMUM						Heating/Cooling Equipment Efficiency[9]
	Glazing Area %[1]	Glazing U-Factor[2]	Ceiling R-Value[3]	Wall R-Value[4]	Floor R-Value[5]	Basement Wall R-Value[6]	Slab Perimeter R-Value[7]	Crawl Space Wall R-Value[8]	
1	12%	0.40	R-38	R-25	R-19	R-17	R-14	R-18	Normal
2	12%	0.30	R-38	R-16	R-19	R-16	R-11	R-16	Normal
3	15%	0.35	R-49	R-25	R-19	R-17	R-14	R-18	Normal
4	15%	0.30	R-38	R-21	R-19	R-16	R-12	R-17	Normal
5	12%	0.65	R-49	R-18	R-15	R-13	R-3	R-14	High Heating
6	12%	0.50	R-30	R-13	R-19	R-18	R-8	R-26	High Heating
7	12%	0.45	R-30	R-13	R-15	R-13	R-3	R-15	High Heating
8	15%	0.50	R-38	R-17	R-15	R-13	R-3	R-14	High Heating
9	15%	0.40	R-38	R-13	R-15	R-13	R-3	R-14	High Heating
10	20%	0.40	R-38	R-18	R-15	R-14	R-3	R-15	High Heating
11	20%	0.35	R-38	R-19	R-11	R-9	R-2	R-8	High Heating
12	25%	0.35	R-38	R-23	R-15	R-14	R-3	R-15	High Heating

FOOTNOTES:

[1] Glazing area is the ratio of the area of the glazing assemblies (including sliding-glass doors, skylights, and basement windows but excluding opaque doors) to the gross wall area, expressed as a percentage. Up to 1% of the total allowed glazing area may be excluded from the U-value requirement. For example, 3 ft^2 of decorative glass may be excluded from a building design with 300 ft^2 of glazing area.

[2] Glazing U-factors must be tested and documented by the manufacturer in accordance with the National Fenestration Rating Council (NFRC) test procedure or taken from the glazing U-factor table in Appendix B. Center-of-glass U-factors cannot be used.

[3] The ceiling R-values do not assume a raised or oversized truss construction. If the insulation achieves the full insulation thickness over the plate lines of exterior walls, R-30 insulation may be substituted for R-38 insulation and R-38 insulation may be substituted for R-49 insulation. Ceiling R-values represent the sum of cavity insulation plus insulating sheathing (if used). For ventilated ceilings, insulating sheathing must be placed between the conditioned space and the ventilated portion of the roof.

[4] Wall R-values represent the sum of the wall cavity insulation plus insulating sheathing (if used). Do not include exterior siding, structural sheathing, and interior drywall. For example, an R-19 requirement could be met *EITHER* by R-19 cavity insulation *OR* R-13 cavity insulation plus R-6 insulating sheathing. Wall requirements apply to wood-frame wall constructions. Metal-frame wall or mass (concrete, masonry, log) wall equivalent R-values can be found in the Prescriptive Packages User's Guide.

[5] The floor requirements apply to floors over unconditioned spaces (such as unconditioned crawlspaces, basements, or garages). Floors over outside air must meet the ceiling requirements.

[6] Walls of conditioned basements below uninsulated floors must be insulated from the top of the basement wall to a depth of 10 ft below ground level or to the level of the basement floor, whichever is less. The entire opaque portion of any individual basement wall with an average depth less than 50% below grade must meet the same R-value requirement as above-grade walls. Windows and sliding glass doors of conditioned basements must be included with the other glazing. Basement doors must meet the door U-factor requirement described in Note b.

[7] The R-value requirements are for unheated slabs. Add an additional R-2 for heated slabs, except in Zone 1 which does not require slab insulation. For packages with a slab insulation requirement, the insulation must extend a total linear distance of at least 24 in. in Zones 2-12 and 48 in. in Zones 13-17. The insulation must extend 1) down from the top of the slab, or 2) down from the top of the slab to the bottom of the slab and then horizontally underneath the slab, or 3) down from the top of the slab to the bottom of the slab and then horizontally away from the slab, with pavement or at least 10 in. of soil covering the horizontal insulation.

[8] The crawl space wall R-value requirements are for walls of unventilated crawl spaces. The crawl space wall insulation must extend from the top of the wall (including the sill plate) to at least 12 in. below the outside finished grade. If the distance from the outside finished grade to the top of the footing is less than 12 in., the insulation must extend a total vertical plus horizontal distance of 24 in. from the outside finished grade.

[9] *High Heating* means a furnace AFUE of 90% or more, or a heat pump HSPF of 7.8 or more. *High Cooling* means a SEER of 12 or more. *High Heat/Cool* means both heating and cooling equipment must meet these minimum efficiencies. If you plan to install more than one piece of heating equipment or more than one piece of cooling equipment, the equipment with the lowest efficiency must meet or exceed the efficiency required by the selected package. The following California counties do not qualify for the cooling equipment credit: Alameda, Contra Costa, Los Angeles, Marin, Monterey, Napa, Orange, San Benito, San Diego, San Francisco, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Solano, Sonoma, and Ventura.

NOTES:

a) Glazing areas and U-factors are maximum acceptable levels. Insulation R-values are minimum acceptable levels. R-value requirements are for insulation only and do not include structural components.

b) Opaque doors in the building envelope must have a U-factor no greater than 0.35. Door U-values must be tested and documented by the manufacturer in accordance with the NFRC test procedure or taken from the door U-factor table in Appendix B. If a door contains glass and an aggregate U-factor rating for that door is not available, include the glass area of the door with your windows and use the opaque door U-factor to determine compliance of the door. One door may be excluded from this requirement (i.e., may have a U-factor greater than 0.35).

c) If a ceiling, wall, floor, basement wall, slab-edge, or crawl space wall component includes two or more areas with different insulation levels, the component complies if the area-weighted average R-value is greater than or equal to the R-value requirement for that component. Glazing or door components comply if the area-weighted average U-factor of all windows or doors is less than or equal to the U-factor requirement (0.35 for doors). Use the *R-Value/U-factor Weighted Average Worksheet* for these computations.

d) Hyphens (--) in any foundation column indicate that the package which contains the hyphens cannot be used with the indicated foundation type.

e) In Zones 1-7, the area-weighted average SHGC value of all glazing cannot exceed 0.4. SHGC values must be determined in accordance with the NFRC test procedure or taken from the default SHGC table in Appendix B.